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CLIMATE INFORMATION FOR DEVELOPMENT NEEDS: **AN ACTION PLAN FOR AFRICA** **REPORT ON THE IMPLEMENTATION STRATEGY**

A CONSOLIDATED REGIONAL ACTION PLAN FOR AFRICA

Introduction

An important part of the vision for the Global Climate Observing System (GCOS) is that all countries and governments will have readily available to them the climate data and related information that they need to manage and adapt to the impacts of climate. However, systematic observation of climate in most countries of Africa is, at present, inadequate to permit reliable assessment, quantification, and prediction of climatic conditions and their impacts. Immediate action must be taken to address critical deficiencies in these programmes, since adaptation to climate and managing its impacts are critical factors in the pursuit of sustainable development, poverty reduction, and the protection of human lives and health in Africa.

Recognizing the problem, the Conference of the Parties (COP) to the UN Framework Convention on Climate Change (UNFCCC) invited the GCOS Secretariat to initiate a Regional Workshop Programme so that deficiencies in climate monitoring capabilities in various regions of the globe could be identified and assessed and so that actions to remedy critical shortcomings could be proposed. The GCOS Secretariat organized two of the ten workshops in the Programme in sub-Saharan Africa. The first of these workshops, for the countries of Eastern and Southern Africa (ESA), was organized in October 2001 in Kisumu, Kenya. The Directors of National Meteorological Services and National Climate Change Coordinators who attended the workshop noted that observing systems in sub-Saharan Africa were inadequate and/or had been deteriorating in recent years. A small group of those who participated in this workshop met again in January 2002 to draft a Regional Action Plan. Upon completion, this Plan contained fourteen high-priority projects with particular relevance for global and regional needs. In a similar manner, GCOS organized a Regional Workshop for the Directors of National Meteorological Services and National Climate Change Coordinators of the countries of Western and Central Africa (WCA). This workshop was held in Niamey, Niger in March 2003. A follow-up meeting to develop an Action Plan for this region was held in Dakar, Senegal in September 2003. The resulting RAP, issued in 2004, contains ten high-priority projects. A GCOS Mediterranean Basin Workshop was held in November 2005, which includes projects in North Africa. The Action Plan for this workshop is in preparation.

While the two Regional Action Plans (RAPs) were focused primarily on implementation of climate observing systems in support of the needs of the Framework Convention on Climate Change, the actions required and the priority projects proposed are essentially identical with those needed for support of sustainable development and the Millennium Development Goals.

The urgent requirement to assist countries of Africa to secure resources with which to implement the projects contained in the two RAPs provided the initial impetus for organizing the Addis Ababa meeting, "Climate Information for Development Needs: An Action Plan for Africa." As a result of discussions that took place at the meeting

following agreement on the essential features of an overall Strategy and Implementation Programme for “Climate for Development in Africa” (ClimDev Africa), participants decided to consolidate the two Action Plans into one for all of sub-Saharan Africa. Six of the 24 projects contained in the two original RAPs treat the same subjects in both subregions. Hence, the number of unique projects has been reduced to 18 to produce a consolidated Action Plan. The overall objective of the consolidated “GCOS Regional Action Plan for Africa” is to remedy significant deficiencies in systematic climate observation programmes in sub-Saharan Africa in order to ensure that the data and information produced by them meet the needs of decision-makers in support of the Millennium Development Goals.

The complete Regional Action Plans for both regions (ESA RAP and WCA RAP) may be viewed on the GCOS website (<http://www.wmo.ch/web/gcos/gcoshome.html>). The RAPs are strategic, agenda setting documents and contain only brief project descriptions and approximate costs rather than detailed project plans. Hence, an initial activity will be to prepare a consolidated (i.e., Africa-wide) and re-costed set of projects that are in line with the priority guidance given by the Addis Ababa meeting and that provide the detail necessary to conform to the requirements of specific donors.

The following sections give brief descriptions of the 18 separate projects contained in the combined Action Plans for Eastern and Southern Africa and Western and Central Africa. The first section introduces those 12 projects that support all four Result Areas (i.e., Policy; Climate Risk Management; Climate Services; and Observations, Data Management, and Infrastructure) as defined by the ClimDev Africa Strategy and Implementation Programme, principally by addressing fundamental climate observation and data management needs. Participants in the Addis Ababa meeting considered the first six of the projects in this category to be of somewhat higher priority than the second six. Each of these projects will be updated, re-costed, and further refined so that they meet the proposal requirements of funding agencies.

The second section introduces Action Plan projects that are especially targeted at improving climate services (Result Area 3); the third introduces a project that is focused particularly on climate risk management (Result Area 2); and the fourth introduces two projects that address needs for improved policy (Result Area 1). Since Result Areas 1, 2, and 3 were not a particular focus of the RAPs, the ClimDev Africa strategy recognizes that additional project identification and development for these Result Areas will need to take place. Additional project proposals addressing observations and data management (Result Area 4) may also be developed, as the consolidated Action Plan for Observations, Data Management, and Infrastructure will be referred to the WMO Regional Association I and other key GCOS implementing and user-community bodies for review, endorsement, and implementation action. Sponsors will be invited to support the funding and implementation of this consolidated Action Plan.

Projects That Support All Result Areas:

1. ***Rescuing historical climatological and hydrological data.*** Data rescue is vital to preserving historical records related to the climate, the hydrology, and the weather. Historical data provide the observational basis for scientific, engineering, and

economic decisions for countries in the region. Numerous data were collected during the colonial period and later by National Services as well as by the scientific community, but no detailed inventory has thus far been published. Moreover, the paper on which much early data are recorded is deteriorating and some other electronic storage media are becoming obsolete. This project would undertake to digitally photograph and process available original historical observational data and provide training in the techniques of data rescue. Making this valuable data available will contribute to a whole range of societal benefits, from helping to support agriculture to improving water resources management.

Principal Project objectives:

- Assemble and inventory all available hydrometeorological observational data;
- Provide for digital photographing of all available original historical observational data;
- Provide the capability for NMHSs in each project country to photograph and digitize current and future observations;
- Establish procedures for data quality control; and
- Assist countries (NMHSs) in ensuring that the data rescue, archiving and quality control programmes continue.

Approximate cost: \$500,000. (See ClimDev Africa 9.4a and WCA RAP Project 7).

- 2. Improving capacities for regional data management.** Despite numerous efforts by regional National Meteorological and Hydrological Services (NMHSs), the region suffers from deficiencies in the organization and management of national and regional databases of climatological and hydrological data. These include problems related to data quality control and reliability, the provision of up-to-date descriptions and analyses, and data exchange and dissemination between NMHSs and the World Data Centres. The project would implement suitable climatological and hydrological data management systems, train relevant staff, and greatly improve the data management capabilities of regional and national centres. This project will enable improved use of existing data, as well as of data generated through the implementation of other projects, for a variety of climate-related purposes.

Principal Project Objectives:

- Rescue and archival of climatological and hydrological data;
- Creation of reliable databases of climatological and hydrological data;
- Reinforcement of the data processing capacities of regional institutions and improvement of the mechanisms of data exchange and dissemination between the NMHSs and the World Data Centres; and
- Implementation of a climatic and hydrological monitoring system.

Approximate cost: \$6,500,000. (See ClimDev Africa 9.4b, WCA RAP Project 8, and ESA RAP Project 3.7).

- 3. Improving Telecommunication Facilities for the Collection and Exchange of Climate Data.** A crosscutting need for the region is to overcome widespread shortcomings in telecommunications, which seriously inhibits exchange of data even

if the observations themselves are being performed in a sustained and high-quality manner. Weakness of public telecommunications infrastructure in several countries, the obsolescence of the autonomous means of telecommunication currently used by the National Meteorological and Hydrological Services (NMHSs), and the difficulties in obtaining associated supplies such as power in a number of centres have been identified as the major shortcomings. A five-phased project proposes the evaluation of current capacity, strengthening of infrastructure with initial priority on GCOS Surface Network (GSN) and GCOS Upper Air Network (GUAN) stations, acquisition of data dissemination systems, technical training, and extension of enhanced telecommunications to other GCOS network components.

Principal Project Objectives:

- Implement appropriate means of telecommunication to ensure timely GTS relay of quality-controlled GSN and GUAN reports between and among observing stations, national climate data-management centres, World Climate Data Centres, and specialized regional centres (ACMAD, AGRHYMET, etc.) for the purposes of processing and relaying these data to end users;
- Implement data dissemination and distribution systems by satellite, email, radio, etc., for the purposes of relay of data to end users;
- Provide capacity building in the use and maintenance of the specific equipment that is installed.

Approximate cost: \$22,000,000. (See ClimDev Africa 9.4c, WCA RAP Project 3, and ESA RAP Project 3.8).

4. ***Upgrading Stations in the GCOS Upper Air Network (GUAN).*** There is a strong need to upgrade stations in the GCOS Upper Air Network to conform with GCOS Best Practices. An upgrade of the stations in the region is necessary to ensure that these stations are fully operational for the production of systematic meteorological observations. To date, irregular reporting of near-real-time and historical data, as well as unacceptably large random variations or biases in the measured parameters have been prevalent, mainly due to a lack of equipment, insufficient local operating capacity, and poor communication and archiving facilities. Implementing the project would help improve description and prediction of future climate, reduce losses from natural and human-induced disasters, and mitigate and adapt to climate variability and change.

Principal Project Objectives:

- Upgrade upper-air stations in Africa to ensure that these stations are fully operational and adhere to best practices for the production of systematic upper-air observations;
- Ensure that the TEMP and CLIMAT TEMP reports of these stations are available internationally (i.e., at World and Regional Specialized Meteorological Centres and World Climate Data Centres) through the Global Telecommunications System (GTS) for the immediate and long-term future.

Approximate cost: \$3,500,000. (See ClimDev Africa 9.4d, WCA RAP Project 1, and ESA RAP Project 3.1).

5. **Upgrading Stations in the GCOS Surface Network (GSN).** Improvement of the GCOS surface network in Africa is critical for better understanding of climate change and variability regionally and globally. Many of the stations in these networks either do not report temperature and precipitation regularly or are silent. These shortcomings severely limit the quality of climate monitoring and prediction both on the regional and global scales. Upgrading of individual stations and capacity building to carry out day-to-day operations will be a cost-effective means to improve these observations on a sustainable basis.

Principal Project Objectives:

- Ensure that GSN stations are fully operational and adhere to best practices for the production of reliable systematic surface observations and environmental data;
- Ensure that the SYNOP and CLIMAT reports of these stations are available internationally (World and Regional Specialized Meteorological Centres and World Climate Data Centres), through the Global Telecommunications System (GTS) and/or other communication channels, for the immediate and long-term future;
- Ensure the provision of national and regional climatology information for use in application for sustainable development.

Approximate cost: \$5,500,000. (See ClimDev Africa 9.4e, WCA RAP Project 2, and ESA RAP Project 3.1).

6. **Improving hydrological observations and hydrological data management.** Improving hydrological observations through the installation of a real- or near-real time hydrological data collection, transmission, and dissemination system will be highly beneficial for water management, as well as for adaptation to climate change and variability. Improvements will help build capacity for efficient integrated regional water resources management. An overarching objective of this project is to counter the progressive deterioration in the capacity of the National Hydrological Services (NHSs) to supply data and information on the state of their water resources. Improved observations will help support sustainable agriculture and combat desertification and lead to better management and protection of terrestrial, coastal, and marine ecosystems.

Principal Project Objectives:

- Assess the state of existing hydrological networks and their ability to deliver accurate and reliable hydrological data and information;
- Improve and upgrade existing hydro-meteorological networks to an optimum status (cf. WMO Minimum Standards for Hydrological Networks);
- Install a network of real or near-real time hydrological data collection and transmission systems through satellite in collaboration with the NMSs;
- Support NHSs in developing and/or improving their hydrological databases and eventually integrating them into a regional database;
- Build and/or enhance institutional, human, and operational capacity in data collection, transmission, processing, dissemination, and management; and

- Develop partnerships through collaboration in data collection and exchange.

Approximate cost: \$8,500,000. (See ClimDev Africa 9.4f, WCA RAP Project 5, and ESA RAP Project 3.4).

- 7. Ensuring high-quality greenhouse gas and air quality monitoring.** This project seeks to improve observation of key constituents of the atmosphere, including greenhouse gases and air quality parameters at stations contributing to the Global Atmosphere Watch (GAW) global and regional networks. Measuring greenhouse gas trends and variability allows the detection of regional carbon sources and sinks. Irregular reporting from these stations due to lack of equipment, inadequate support by qualified staff, and telecommunication problems seriously hamper sustained operation. Missing high-quality data in Africa leads to biases in the performance of climate models and predictions, and therefore affects the credibility of climate change scenarios.

Principal Project Objectives:

- Assess, rehabilitate, and/or automate the existing GAW network;
- Build capacity related to operation, maintenance, and repair;
- Ensure an improved programme of measurements related to climate change; and
- Ensure continuous and timely quality data flow.

Approximate cost: \$750,000. (See ESA RAP Project 3.2).

- 8. Reliably detecting and attributing carbon sources and sinks.** This project proposes a set of measures for a 5-year timeframe to further reduce uncertainty in observing the carbon cycle, which is vital in the regional and global context of the Kyoto protocol. Those include additional high-precision ground-based and airborne profile measurements of atmospheric CO₂, carbon flux observations in an African flux tower network, regular mapping of land cover and maintenance of a land cover database, as well as the derivation of carbon cycle indicators from satellite data. Integration of all carbon cycle observations will lead to improved mapping of carbon sources and sinks, which in turn will help mitigation and adaptation to climate variability and change and prediction of future climate.

Principal Project Objectives:

- Build capacity and promote regional carbon cycle syntheses;
- Operate two additional atmospheric CO₂ sampling stations within the subcontinent (Africarbon);
- Establish a network of existing carbon flux measurement sites in savannas and encourage establishment of three new sites in under-sampled biomes (Afriflux);
- Observe carbon-cycle-relevant parameters at fifty RSN stations located on national agricultural research stations, forestry research stations, or ecological research stations (African production network); and

- Create a database of land-surface characteristics for climate, hydrological and carbon cycle modeling at 500 locations in the region (Reference Patch Network).

Approximate cost: \$1,600,000. (See ESA RAP Project 3.3).

9. Monitoring inland lakes as indicators of climate change. Inland lakes, in particular in Eastern and Southern Africa, are important components of the climate and water resources for the region. Further, a majority of the population of this region live around these lakes and depend heavily on their resources for their livelihood. Changes in inland lakes would be useful indicators of regional and global climate change. This project will enhance the monitoring of inland lake variables in order to contribute to better understanding and prediction of climate change. The project will also contribute to the sustainable development and use of the marine resources of the major inland lakes, to the protection of their marine environments, and to better long-term planning and management of the impacts of climate variability and change.

Principal Project Objectives:

- Enhance the lake observation network;
- Build capacity in marine meteorology/hydrology, data collection, instrumentation, and quality control
- Systematically collect, exchange, and analyze data for selected parameters; and
- Improve infrastructure for effective data exchange.

Approximate cost: \$275,000. (See ESA RAP Project 4.3).

10. Improved monitoring of changes in African ocean and coastal environments in support of integrated coastal management. Observations of the oceanic and coastal environment play a key role in the assessment of regional climate change and variability, as well as in other societal areas, such as fisheries and coastal management. A specific focus of this project is on monitoring sea level. Enhanced training for the region in the use of satellite observational data to determine ocean parameters, such as sea-surface temperature, ocean colour (biological activity), and ocean salinity is also required, e.g., by establishing a link with the Regional Ocean Observing and Forecasting System for Africa Project (ROOFS-Africa). In the Western Indian Ocean improved networks would be complemented with the establishment of one or two regional centres of excellence that can make use of in-situ and satellite observations and ocean-atmosphere models.

Principal Project Objectives:

- Establish an ocean observing system, which will produce data and products addressing a broad spectrum of user needs, including shipping, agriculture, fishing, recreation, tourism, and government ministry needs for long-term planning.

Approximate cost: \$6,750,000 for ESA RAP project only. (See ESA RAP Project 3.5 and WCA RAP Project 4—ROOFS Africa Project).

11. Undertaking observations for sustainable urban development. Observations of the urban environment have become more important in planning and environmental management, as urban centres in the region continue to grow. Large urban centres also have significant effects on regional climate. Building institutional and technical capacity for effective and sustainable urban monitoring, e.g., of air pollution, land cover, or other climatological parameters, will contribute to improved health and welfare of urban communities.

Principal Project Objectives:

- Build technical and institutional capacity for effective and sustainable observations of the urban area; and
- Establish urban observation systems in major cities in sub-Saharan Africa.

Approximate cost: \$2,000,000. (See ESA RAP Project 4.2).

12. Undertaking glacier monitoring for climate and water resources assessment. Establishing a reliable, consistent and sustainable glacier observing system for Mt. Kenya, Mt. Kilimanjaro, and Mt. Ruwenzori would allow continuous monitoring of glacier volumes and spatial extent, using both ground-based and satellite data. Apart from standalone studies, such observations have not been carried out systematically to date, limiting the understanding of the region's climate change and dynamics and the ability to predict the future of these mountain glaciers, which are among the most important water resources in the region, as well as important indicators of climate change.

Principal Project Objectives:

- Establish a reliable, consistent, and sustainable glacier observing system for Mt. Kenya, Mt. Ruwenzori, and Mt. Kilimanjaro;
- Monitor the glacier volumes and spatial extent of these glaciers through ground and satellite based methods;
- Study the past climatic conditions of the region from glacier ice core records; and
- Determine the glacial contribution to the flow levels of rivers.

Approximate cost: \$600,000. (See ESA RAP Project 4.1).

Projects Principally Supporting Climate Services (Result Area 3):

1. Supporting the health sector with climate information. Weaknesses in regional climate observing systems limit the current application of climate data for decisionmaking in the health sector. The project proposes new measures and support to ongoing measures to recover, create, and use relevant data to predict the spatio-temporal distribution of infectious diseases. This project would strengthen regional capacity and help promote closer partnerships among the health and climate/environment sector ministries of countries in the region, as well as with other relevant organizations sharing common borders, common ecological zones, or common infectious disease problems. Through targeted networking and community building broader use of predictive models, including climate change scenarios and decision

support tools, could be achieved in the region, thus leading to improved health surveillance. (This project attracted special early interest at the Addis Ababa meeting, and, as a result, IRI has been asked by DFID to prepare a “Concept Note” to flesh out the project in further detail.)

Principal Project Objectives:

- Create the environment in which to share expertise, data, and products, and through joint ownership, to energize the regional, national, and local capacity to describe, monitor, and predict the spatial and temporal distribution of climate related infectious diseases and thereby prevent and control them in a more efficient way;
- Improve health surveillance through the enhanced use of appropriate climate/environmental data on selected areas over Niger, Mali, and Burkina Faso.

Approximate cost: Not available. (See ClimDev Africa 9.3.5 and WCA RAP Project 10).

2. Supporting local decisionmaking by developing a climate information partnership. There is a widespread need in Africa to enable technical institutions to work more effectively together in an information partnership, especially in the context of local rural development and its relation to climate change and variability. The aim of this project is to provide reliable and timely environmental information for community development decisions in a range of societal areas in cost effective and sustainable ways. An integrated data collection, processing and dissemination system would be developed, ultimately leading to a multi-disciplinary local/rural development toolkit. Examples for this approach have been successfully demonstrated in some countries in the region, with great benefits to local communities, agents of change, and the technical institutions providing data and services. This project was initially proposed to be undertaken in several pilot areas in Western and Central Africa. It is desirable, however, that it be eventually expanded to other parts of Africa.

Principal Project Objectives:

- Make rural development more sustainable for poor communities through improved information sharing practices that involve the communities themselves. This requires technical institutions to work more coherently, sharing information with each other as well as developing improved 2-way communication with rural communities.

Approximate cost: \$1,200,000. (See ClimDev Africa 9.3.6 and WCA RAP Project 6).

3. Enhancing application of satellite observations for climate and society. In the past, technological and scientific advances in satellite observations, e.g., for the purpose of numerical weather prediction and climate monitoring, have not always been transferred to the countries of the region, which rarely had access to satellite data and lacked the infrastructure and skill to process it. The PUMA (Preparation for the Use of METEOSAT Second Generation in Africa) project has addressed some of these

deficiencies, but many still remain. The project would enhance capacity building in the interpretation and use of satellite data, e.g., through workshops, public education, networking among regional experts, and soliciting user requirements from all application areas.

Principal Project Objectives:

- Integrate remotely sensed data with the data observed from traditional stations;
- Develop methodologies for the conversion of remotely sensed data into measures of weather and climate variables;
- Enhance the capacity of the region for the effective utilization of remotely sensed data in the monitoring of weather and climate; and
- Raise awareness of the use of space technology among decisionmakers.

Approximate cost: \$2,400,000. (See ClimDev Africa 9.3.7, WSA RAP Project 9, and ESA RAP Project 3.6).

Project Principally Supporting Climate Risk Management (Result Area 2):

1. *Developing capacity for the assessment of societal vulnerability and adaptation to climate change and variability.* Developing countries will be among the first and hardest hit from the adverse impacts of climate change because of their low adaptive capacity. The basis for undertaking research in vulnerability and adaptation is inadequate in the region. A set of targeted measures is required to improve understanding of the vulnerability of the region to climate change. These measures range from improving access to quality-controlled data, such as temperature and rainfall, to the use of regional climate change scenarios derived from climate models, to the incorporation of adaptation options into countries' development plans for various socio-economic sectors.

Principal Project Objectives:

- Improve availability of quality-controlled research data sets for key variables, such as temperature and rainfall, for the purpose of climate change monitoring, detection, and attribution and for vulnerability and adaptation studies;
- Ensure availability and application of consistent standards, methodologies, and tools for vulnerability and adaptation assessment as well as for monitoring, detecting and attributing climate change;
- Enhance expertise in integrated climate change vulnerability and adaptation assessments and in scenario development; and
- Improve the understanding of the vulnerability of the region to climate change and to promote the incorporation of adaptation options in development plans including the application of climate information for decision making in various socio-economic sectors

Approximate cost: \$3,000,000. (See ClimDev Africa 9.2.4 and ESA RAP Project 4.4).

Projects Principally Supporting Policy: Awareness Raising, Accountability, and Advocacy (Result Area 1):

1. *Building capacity in public understanding of climate change and variability.*

Improving public awareness and education at all levels on climate change, with a focus on the importance of observational data, will serve as a basis for addressing climate change on a regional scale. Training at the community level, e.g., through appropriate curricula, leaflets, media training, and workshops, is key to ensure that various communities are aware of the impact of climate change and variability on their daily life, and that they appreciate the value of systematic observations for targeted adaptation measures.

Principal Project Objectives:

- Improve public awareness and education in the field of climate change with a focus on the importance of observational data as a basis for tackling the issue of climate change;
- Provide training to ensure that various communities are also aware of the climate change and variability issues and the use climate data and information acquired through systematic observations; and
- Raise awareness at various societal levels of the importance of climatic information for improved management of socio-economic activities.

Approximate cost: \$1,300,000. (See ClimDev Africa 9.1.4 and ESA RAP Project 3.9).

2. *Improving regional climate predictions and climate change scenarios.*

The assessment of impacts of climate change requires climate change scenario products at regional scales, using existing general circulation models, databases and downscaling techniques. However, due to a lack of observational data, ancillary socio-economic data, and modelling expertise and infrastructure in the region, these regional scenarios suffer from great uncertainties. As a consequence, there are currently no models with reasonable skill to adequately capture the climate in the region. Through improved collaboration with leading modelling centres, appropriate model assessment and targeted capacity building, steps are proposed to establish reliable climate change scenarios.

Principal Project Objectives:

- Review of past and on-going activities on climate modeling;
- Acquisition of the necessary workstations for climate change scenarios in the region;
- Identify, evaluate, and validate appropriate GCMs for use over our region;
- Identify and customize regional climate models for downscaling climate change scenarios from GCMs for vulnerability assessment studies;
- Build capacity (training of personnel) of the region to run simple climate change scenarios; and
- Develop appropriate linkage with other world climate research centers.

Approximate cost: \$700,000. (See ClimDev Africa 9.1.5 and ESA RAP Project 4.5).

Project Costing: The initial costing of the ESA and WCA projects was undertaken at the time of preparation of the RAPs. A summary of the individual project costs, which are subject to refinement and updating, is provided in Table 1.

Table 1. Approximate Project Costs as Proposed in Original Action Plans*	
Project	Approximate Cost USD
Projects That Support All Result Areas	
1. Rescuing Historical Climatological and Hydrological Data	500,000
2. Improving Capacities for Regional Data Management	6,355,000*
3. Improving Telecommunication Facilities for the Collection and Exchange of Climate Data	22,163,000*
4. Upgrading Stations in the GCOS Upper Air Network	3,340,000*
5. Upgrading Stations in the GCOS Surface Network	5,334,500*
6. Improving Hydrological Observations and Hydrological Data Management	8,525,500*
7. Ensuring High-Quality Greenhouse Gas and Air Quality Monitoring	750,000
8. Reliably Detecting and Attributing Carbon Sources and Sinks	1,588,500
9. Monitoring Inland Lakes as Indicators of Climate Change	274,000
10. Improved monitoring of Changes in African Ocean and Coastal Environments	6,715,000
11. Undertaking Observations for Sustainable Urban Development	2,020,000
12. Undertaking Glacier Monitoring for Climate and Water Resources Assessment	580,000
Projects Principally Supporting Climate Services	
1. Supporting the Health Sector with Climate Information	<i>Not Given</i>
2. Supporting Local Decisionmaking by Developing a Climate Information Partnership	1,200,000
3. Enhancing Application of Satellite Observations for Climate and Society	2,350,000*
Project That Principally Supports Climate Risk Management	
1. Developing Capacity for the Assessment of Social Vulnerability and Adaptation to Climate Variability	3,020,000
Projects That Principally Support Policy: Awareness Raising, Accountability, and Advocacy	
1. Building Capacity in Public Understanding of Climate Change and Vulnerability	1,305,000
2. Improving Regional Climate Predictions and Climate Change Scenarios	665,500
TOTAL	
	66,686,000+

- For projects appearing in both Regional Action Plans, the cost reported is the sum of the costs for both regions.

2007

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